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Matls. I.M. 447

INSPECTION AND ACCEPTANCE OF PACKAGED, DRY, COMBINED MATERIALS FOR PC CONCRETE

GENERAL

Acceptance of packaged, dry, combined materials for PC Concrete will be on the basis of approved sources and upon satisfactory documentation and identification of package ingredients.

Approval is based upon packaged materials produced with specific aggregate sources, equipment and processes. Any changes in materials, sources, equipment or processes will void any approval and require that a new approval be sought.

All materials shall meet the requirements for the respective items in Part IV of the Standard Specifications and any applicable Supplemental Specifications.

PROPORTIONING

Equipment for proportioning and mixing and tolerances for proportioning shall be as required in Section 2301 of the Standard Specifications. The Transportation Center Materials Engineer may approve continuous proportioning and mixing equipment that meet Articles 2001.20 and 2001.21 of the Standard Specifications. Aggregates shall be dried, without disintegration, to a moisture content of less than 0.1% by weight, computed on a test sample dried to substantially constant weight at 110°C ±5°C (230°F ±9°F).

SAMPLING AND TESTING

A. Production Quality Control Program

The sampling and testing frequency by the producer shall be that which is considered necessary by the Transportation Center Materials Engineer for proper Quality Control. The following are required minimum frequencies of sampling and testing by the producer:

1. Both coarse and fine aggregate gradation once every two days of certified production of mix.

2. Both coarse and fine aggregate moisture content after drying once every two days of certified production of mix.

The Transportation Center Materials Engineer may increase the sampling and testing frequencies required, if necessary.

B. Control Laboratory Approval

A control laboratory will only be considered approved if it is properly equipped and staffed to perform the tests required for a Quality Control Program. Continued approval of the control laboratory will depend on the comparison of its test results with those of the Transportation Center Laboratory or the Central Laboratory. Unresolved differences in test results will be a basis for discontinuing control laboratory approval.

C. Monitor Sampling and Testing at the Production Plant

The proportioning equipment will be calibrated in the presence of the Transportation Center Materials Engineer or his representative at a minimum of once per year. Samples of Portland Cement, fly ash, coarse aggregate, and fine aggregate will be obtained and sent to the Central Laboratory. The Transportation Center Materials Laboratory will obtain a minimum of one package from each certified production lot and perform monitor testing as follows:

A certified production lot will be assumed to be a continuous production of product without a change to another product and which spans less than 7 consecutive days. The package shall be reduced to sample size by using the splitting method in I.M. 336. A sieve analysis shall be performed according to I.M. 302 except that the coarse aggregate sample size should be 2.5 kg and the dry material passing the 4.75 mm (No. 4) sieve shall be 1000 grams. Results will be compared with certified quantities of each material in the mixture. Significant deviation from certified quantities will require further evaluation before continued use of the represented material is permitted. The content of cement and aggregate passing the 0.075 mm (#200) sieve which deviates more than +20 percent to -10 percent by mass per bag from the amount of cement certified would be considered significant. Gradations -other than material passing the 0.075 mm (#200) sieve- which deviate more than the tolerances below from the gradation certified would be considered significant.

Sieve No.	% Passing (Tolerances)
9.5 mm (⅜ in.)	±10%
4.75 mm (#4)	±10%
.36 mm (#8)	±10%
0.60 mm (#30)	±10%
0.15 mm (#100)	±3%

SOURCE APPROVAL

The Transportation Center Materials Engineer shall recommend plant approval for specific mix designations that are allowed, by specifications, to be pre-packaged. Upon approval by the Central Office of Materials, the source will be listed by mix designation in the appendixes of this I.M.

CERTIFICATION DOCUMENTS

The producer of mixture(s) shall furnish two copies of an invoice or bill of lading which bear the following certification statement and the signature of a responsible company representative, one distributed to the project engineer and one to the Transportation Center Materials Engineer.

Certification Statement

The material herein described has been sampled and tested as prescribed by the Highway Division of the Iowa Department of Transportation and complies with the applicable specification requirements for Iowa DOT mix designation.

Date _____ Signed _____

The bill of lading or invoices shall be identified with a project number if available, and shall denote the quantity in the shipment.

ASSURANCE PROJECT SAMPLING AND TESTING

One package shall be obtained at the project site and sent to the Ames Laboratory. The material will be subject to the same tolerances and will be tested the same as outlined in the section "Monitor Sampling and Testing at the Production Plant." Construction, which contains concrete represented by assurance samples that are outside the tolerances specified, will be subject to the requirements of Article 1105.05 of the Standard Specifications.

PLANT RECORDS

The plant sample test records and signed certification statements for Portland Cement, fly ash, coarse aggregate and fine aggregate shall be available for review by the Project Development Division personnel for at least three years after the mix represented has been produced.

PACKAGE REQUIREMENTS

The packages shall be not less than 10 kg (22½ lbs.) or more than 40 kg (90 lbs.) Packages varying more than 4.00% from the mass printed on the bag will be considered non-compliant and if material is purchased by the Iowa DOT directly, or the average mass of packages in any shipment as shown by weighing 50 packages taken at random is less than that printed on the bag, the entire shipment may be rejected.

The material from which the containers are made shall have a water vapor transmission not greater than 100g/m^2 in 24 hours as determined in accordance with Procedure B of ASTM Test Method E96. The strength of the container shall be adequate for the mass of concrete it is

intended to contain. Packages stored for more than one year after packaging shall be tested prior to incorporation into any work.
All packages shall be identified with the following:

1. Complete name and address of the producer and address of producing plant.

2. Net weight in each package.

3. The specific Iowa DOT mix designation (i.e., M-4, Cl V-M, F-4), the durability class of the coarse aggregate and the gradation designation number of the coarse aggregate.

4. The yield in cubic meters and the amount of water recommended for mixing for the slump intended.

5. The month and year the material was packaged and a production lot designation.